

Middle Fork Grand River
Stanberry, Missouri
Water Supply Study

Middle Fork Lake is privately owned by "Middle Fork Water Company" to supply water to Stanberry and other communities, as well as rural water district. The lake is located on a tributary to Middle Fork Grand River about 10 miles north east of Stanberry.

The average daily use is about 350,000 gallons per day.

The drainage area of the lake is 4037 acres (6.3 square miles).

Middle Fork Lake analysis consisted of using the NRCS's computer program called "RESOP". Following is the data and procedures for input to the program.

STO-AREA Elevation-Storage and Elevation-Area data were determined from July 26, 2000 survey made by USGS.

Middle Fork Grand River Lake			
Elevation (feet)	Area (acres)	Storage (ac-ft)	
868.0	0.12	0.08	
870.0	1.70	0.99	Intake elevation
872.0	5.70	7.32	
874.0	14.23	27.49	
876.0	24.36	65.35	
878.0	35.20	125.05	
880.0	48.37	208.90	
882.0	58.86	316.71	
884.0	69.36	443.30	
884.1	71.44	450.30	Water Surface on 7/26/2000
886.0	86.65	599.87	
888.0	108.97	794.15	
890.0	138.51	1040.67	
892.0	175.09	1352.91	
893.4	206.11	1625.01	

Spillway Elevation = 893.4 Feet mean sea level

Intake Elevation = 870. Feet mean sea level

LIMITS Maximum Pool storage 1625 Ac.Ft.
Minimum Pool storage 20 Ac.Ft.

Starting storage was considered at measured pool (7/26/2000).

The drainage area of the lake is 4037 acres (6.3 square miles).

GENERAL The adjustment to convert from pan evaporation to lake evaporation was made for the control word EVAP. The factors were monthly values. As a result a factor of 100 was used.

The record period of drought is in the 1950's.
Analysis began in January 1951 and ended December 1959.

SEEPAGE The reservoir seepage varied from 0 seepage near empty to a maximum of 2.5 inch per month when at full pool. The material in the dam is compacted earth of clayey soils.

RAINFALL	Rainfall data came from the White Cloud Creek near Maryville, MO. rain gage for the period 1952 through 1960.
RUNOFF	This is the runoff into the lake from its drainage area. Monthly runoff volumes in watershed inches were determined at the White Cloud Creek stream gage. The drainage area is 6.0 square miles. White Cloud Creek gage is located west of Maryville.
EVAP. --	Pan evaporation at the Lakeside gaging station were used as a base because it has data for year around evaporation. This data was updated with gage data from stations at Spickard. The average data from 1952 and 1961 were used when there are no data available from both stations. The monthly adjustment factors to convert from pan to lake evaporation was applied at this step.
DEMAND	Determined from city records. The average daily use is about 350,000 gallons per day and maximum is 450,000 GPD. (from Bill Hills)

MIDDLE FORK GRAND RIVER

Water Supply Study Regional Water Supply Lake Storage Volume

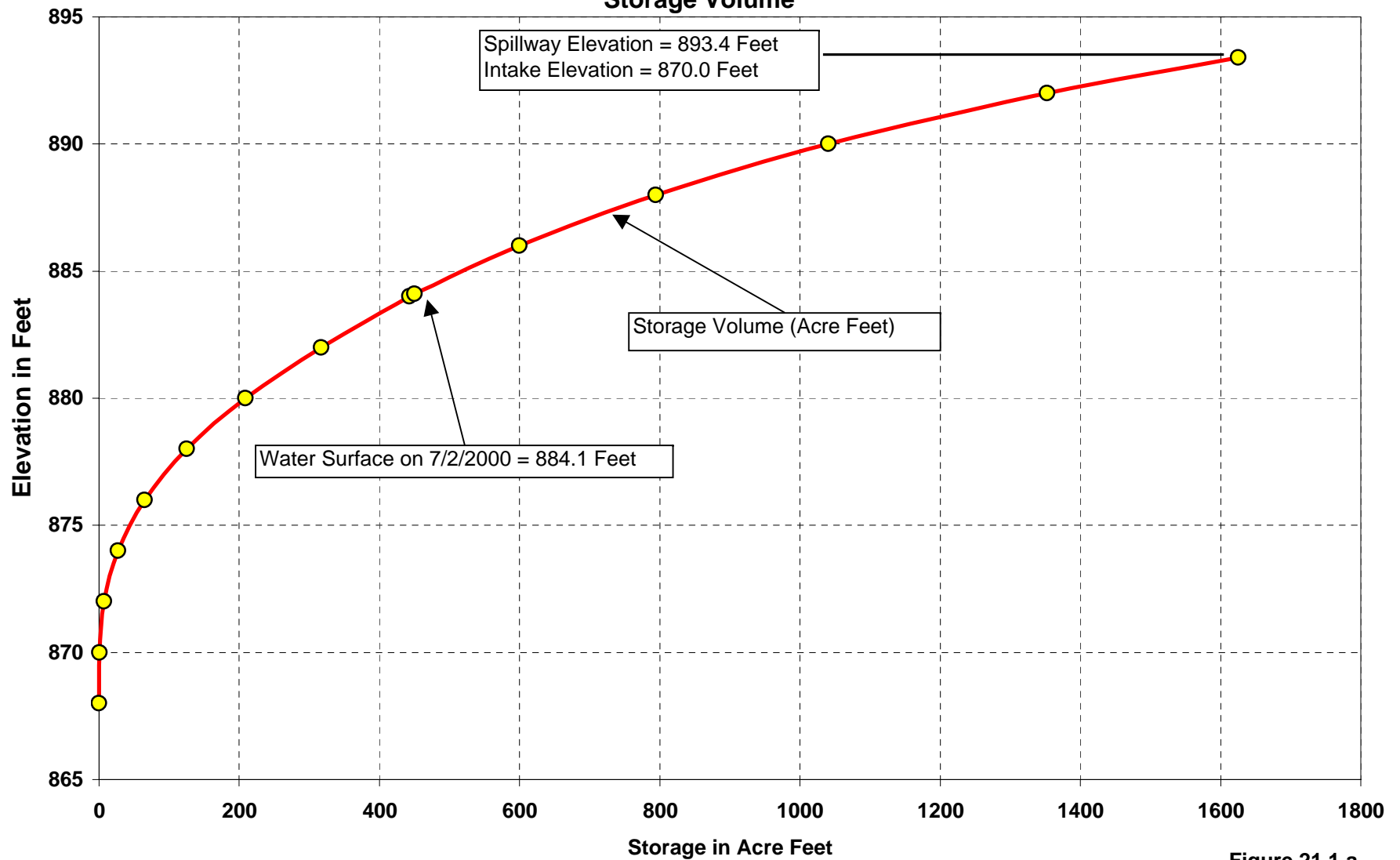


Figure 21.1.a

Middle Fork Grand River
Regional Water Supply Lake
Missouri RESOP Water Supply Analysis
Surface Area

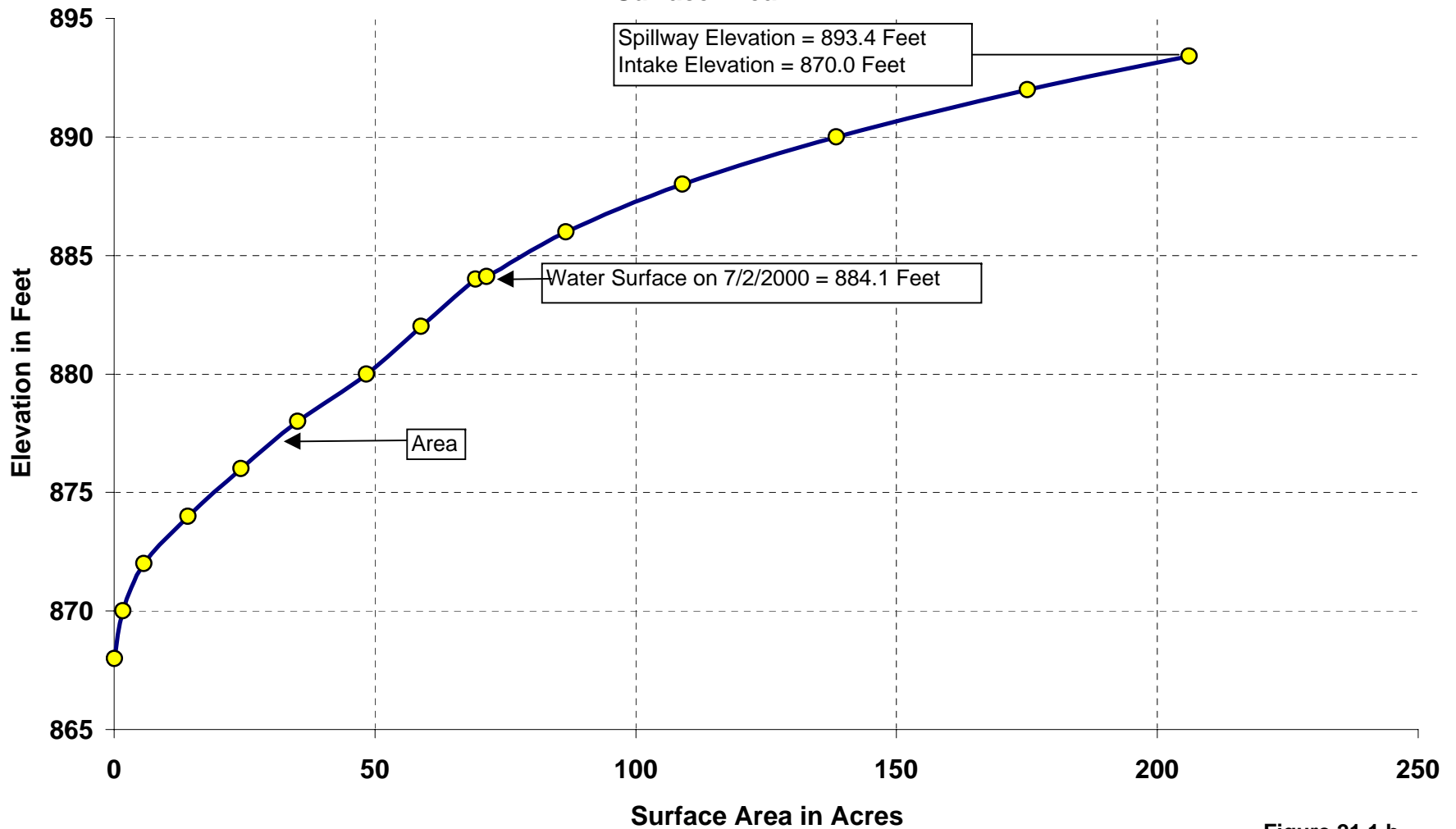


Figure 21.1.b

Middle Fork Grand River
Water Supply Study
Regional Water Supply Lake
Lake Storage

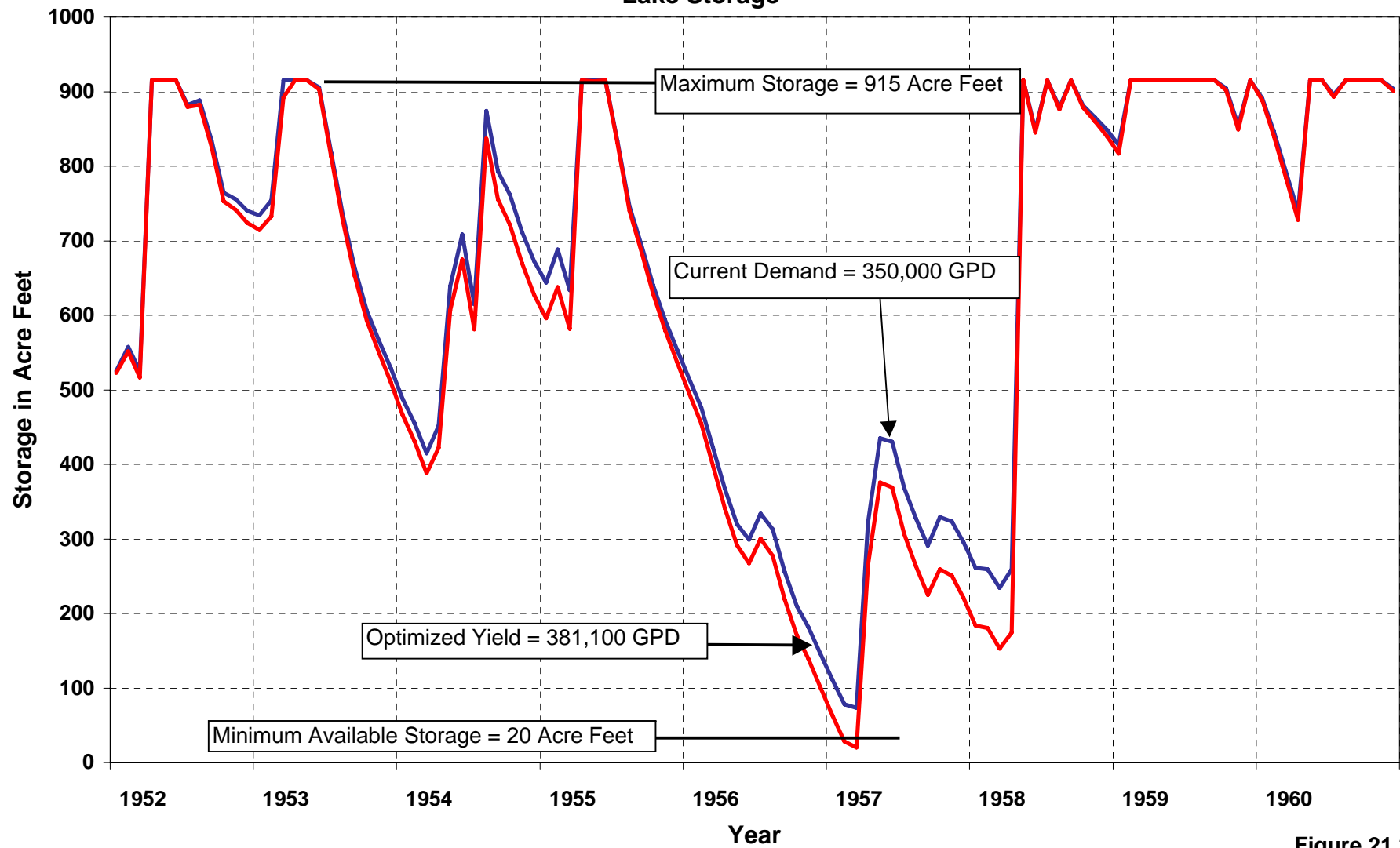


Figure 21.2

Middle Fork Grand River
Middle Fork Water Company
Missouri RESOP Water Supply Analysis
Water Use

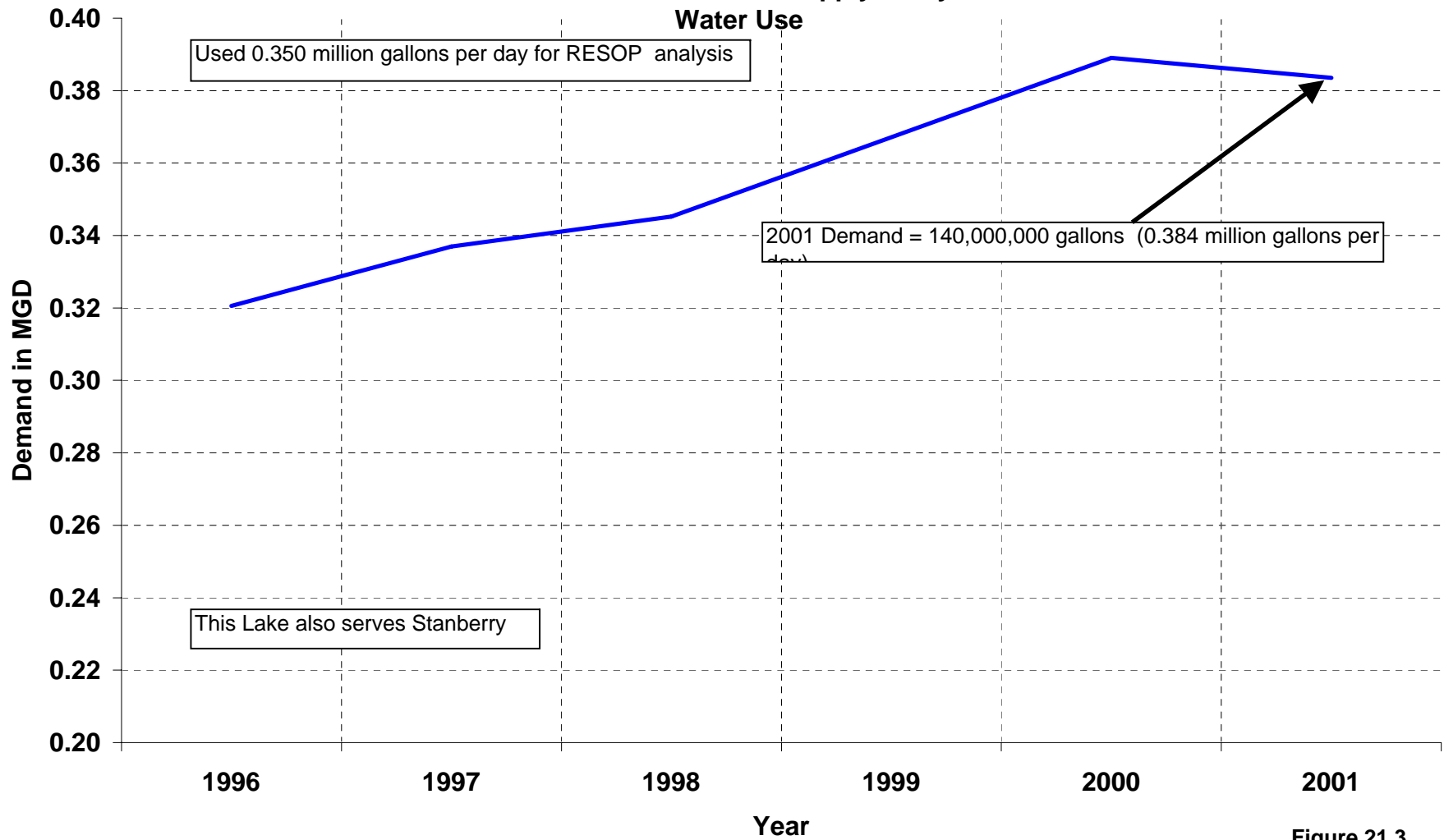
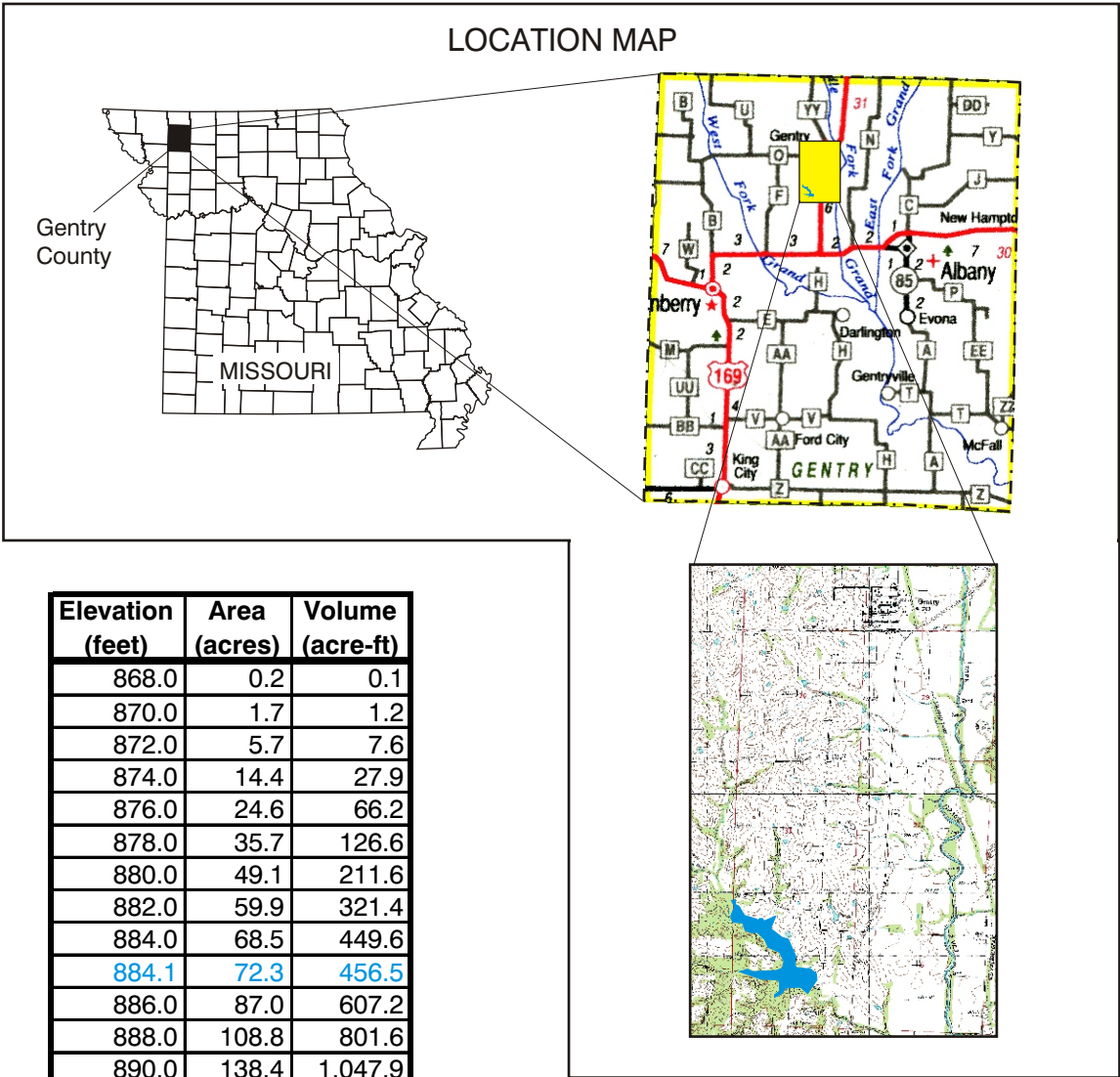


Figure 21.3

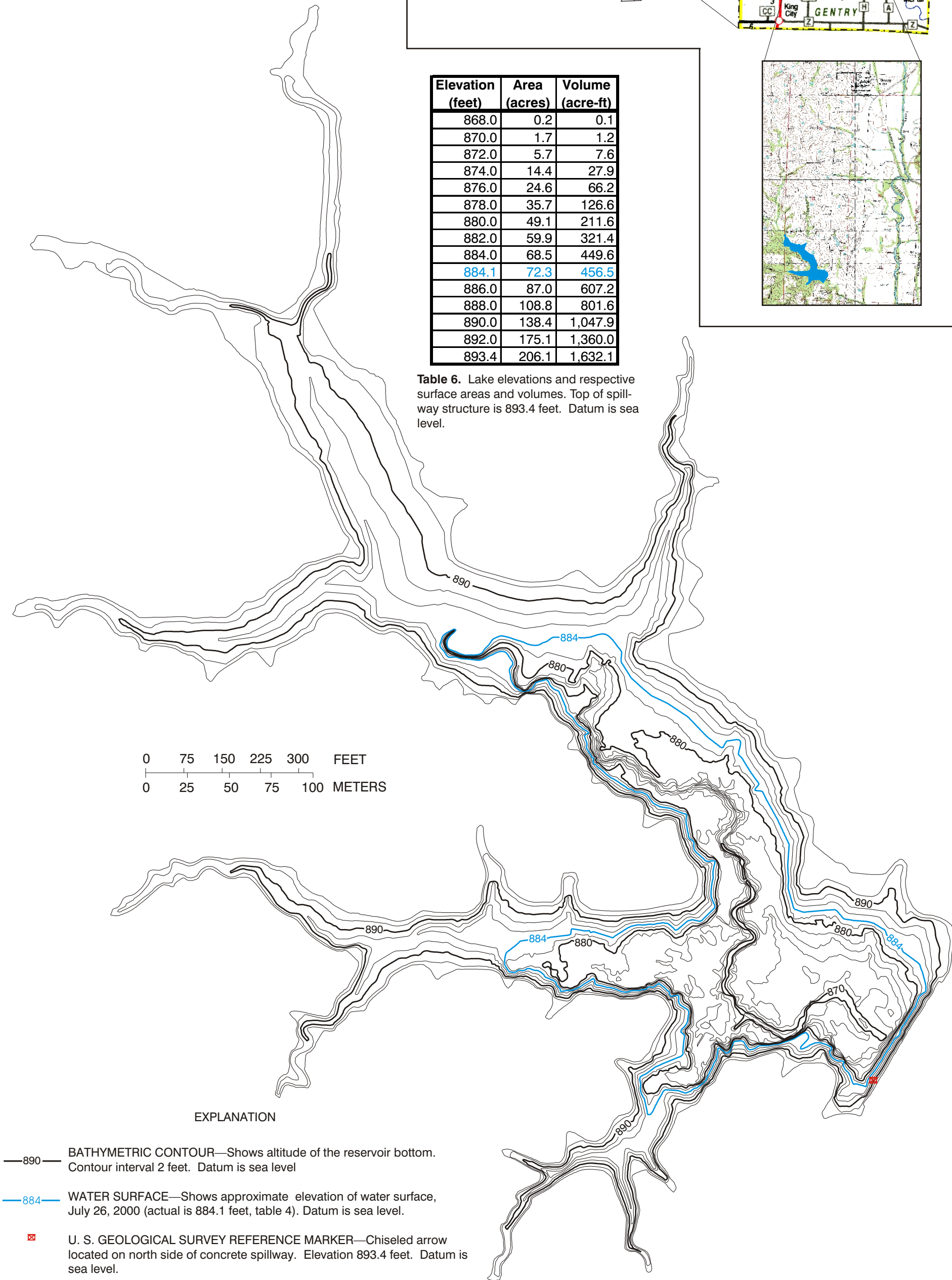
STANBERRY LAKE

LOCATION MAP



Elevation (feet)	Area (acres)	Volume (acre-ft)
868.0	0.2	0.1
870.0	1.7	1.2
872.0	5.7	7.6
874.0	14.4	27.9
876.0	24.6	66.2
878.0	35.7	126.6
880.0	49.1	211.6
882.0	59.9	321.4
884.0	68.5	449.6
884.1	72.3	456.5
886.0	87.0	607.2
888.0	108.8	801.6
890.0	138.4	1,047.9
892.0	175.1	1,360.0
893.4	206.1	1,632.1

Table 6. Lake elevations and respective surface areas and volumes. Top of spillway structure is 893.4 feet. Datum is sea level.



EXPLANATION

- 890 BATHYMETRIC CONTOUR—Shows altitude of the reservoir bottom. Contour interval 2 feet. Datum is sea level
- 884 WATER SURFACE—Shows approximate elevation of water surface, July 26, 2000 (actual is 884.1 feet, table 4). Datum is sea level.
- U. S. GEOLOGICAL SURVEY REFERENCE MARKER—Chiseled arrow located on north side of concrete spillway. Elevation 893.4 feet. Datum is sea level.